

(For Session S4)

**COMPARISON OF OBSERVATIONS OF SPORADIC-E LAYERS IN THE
NIGHTTIME AND DAYTIME MID-LATITUDE IONOSPHERE**

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A comparison of numerous rocket experiments to investigate mid-latitude sporadic-E layers is presented. Electric field and plasma density data gathered on sounding rockets launched in the presence of sporadic-E layers and QP radar echoes reveal a complex electrodynamics including both DC parameters and plasma waves detected over a large range of scales. We show both DC and wave electric fields and discuss their relationship to intense sporadic-E layers in both nighttime and daytime conditions. Where available, neutral wind observations provide the complete electrodynamic picture revealing an essential source of free energy that both sets up the layers and drives them unstable. Electric field data from the nighttime experiments reveal the presence of km-scale waves as well as well-defined packets of broadband (10's of meters to meters) irregularities. What is surprising is that in both the nighttime and daytime experiments, neither the large scale nor short scale waves appear to be distinctly organized by the sporadic-E density layer itself. The observations are discussed in the context of current theories regarding sporadic-E layer generation and quasi-periodic echoes.